

**COSINE BANG-BANG SEEK CONTROL FOR A VOICE COIL OF A  
DISC DRIVE**

**Abstract of the Disclosure**

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A method and apparatus for improving the timing of a seek operation through the removal of the coast phase of conventional model reference waveform type control systems are provided. With the apparatus and method, the coast phase is removed such that an acceleration phase is immediately followed by a deceleration phase in the waveform of the control system. A  $(1-\cos)/2$  shaping is applied to the resulting square waveform so that the affects of high frequency harmonics are minimized. The resulting "cosine bang-bang" waveform provides a reduction in seek time when compared to conventional model reference waveform based control. In addition to the above, the present invention provides a controller architecture in which the cosine bang-bang waveform may be applied to a voice coil motor to control the actuation of the read/write heads of a disc drive. With this controller architecture, the low-pass filters required in a model reference waveform approach are eliminated in favor of  $(1-\cos)/2$  shaping of the square waveform of the present invention. As a result, the increased time requirement due to low pass filtering is eliminated in the controller of the present invention.